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Litchfield. This book tells in a simple way the story of the old Norse gods, and is calculated to awaken an interest in the religion of our Teutonic ancestors. It is based chiefly upon the Eddas. The introductory chapter gives a clear idea of the relative position of the "Nine Worlds" of the mythology, and tells in a few words the relation of the gods and giants to objects in nature. The book is suited to children of any age, and will possess equal interest for general readers.

—Longmans, Green, & Co. will shortly publish, both in London and New York, "The House of the Wolf," a romance by Stanley J. Weyman. It tells the perils and bravery of three young brothers in the fortnight before and after the massacre of St. Bartholomew's Day.

—Messrs. Ginn & Co. announce to be ready in May or June "Elements of the Calculus; Method of Rates," by A. S. Hardy, professor of mathematics in Dartmouth College. This text-book is based upon the method of rates. The object of the differential calculus is the measurement and comparison of rates of change when the change is not uniform. Whether a quantity is or is not changing uniformly, however, its rate at any instant is determined essentially in the same manner: viz., by letting it change at the rate it had at the instant in question, and observing what this change is. It is this change which the calculus enables us to determine, however complicated the law of variation may be. From the author's experience in presenting the calculus to beginners, the method of rates gives the student a more intelligent, that is, a less mechanical, grasp of the problems within its scope than any other. No comparison has been made between this method and those of limits and of infinitesimals. This larger view of the calculus is for special or advanced students, for which this work is not intended; the space and time which would be required by such general comparison being devoted to the applications of the method adopted.

—The February number (No. 45) of the Riverside Literature Series (published quarterly during the school year 1889-90 at 15 cents a single number, by Houghton, Mifflin, & Co., Boston) contains "The Lays of Ancient Rome," by Thomas Babington Macaulay, with the author's introductions and historical notes. The old Latin literature of the Romans had entirely disappeared, and the stories and legends about the early history of Rome were incorporated into the writings of the later historians without any written authority for them. These "Lays of Ancient Rome" were written by Macaulay as an attempt to show how these legends and stories about the early history of Rome would have been sung by the old ballad-mongers, as they wandered from village to village, and repeated to an eager crowd of listeners these old songs which all knew so well and yet always loved to hear. The lays have always been liked by children on account of their life, movement, and romantic incidents, and in this new form the publishers hope that they will gain a still greater and more widespread popularity.

—The University of Pennsylvania has published a translation of "The Federal Constitution of Switzerland," by Professor Edmund J. James. The Constitution of Germany had previously been issued in the same series, so that American political students now have the means of comparing those two important federal governments with our own. The principal difference between the Swiss Constitution and ours is in the executive authority, which in Switzerland is vested in a Federal Council of seven members chosen by the two houses of the national legislature. All executive orders are issued in the name of the council, and, though there is a president of the council, he is nothing but a moderator, with no more authority or dignity than any other member. The present Constitution went into effect in May, 1874, and gives to the central government much greater authority than it had before. Nevertheless, there are strong local and democratic elements in the government still, as a perusal of this pamphlet will show.

—Professor John Fiske will open *The Popular Science Monthly* for May with an account of the life of Edward L. Youmans,

including the story of his association with Herbert Spencer. Professor Fiske was a warm friend of the late Professor Youmans, and describes his fruitful labors in popularizing science and the evolution philosophy in America with sympathetic appreciation. Herbert Spencer has decided to publish the opening chapters of one of the uncompleted parts of his system of philosophy, dealing with morality. Three of these chapters, treating respectively of "Animal Ethics," "Sub-human Justice," and "Human Justice," will be printed in the same number under the general title "On Justice." "Sumptuary Laws and their Social Influence" will be discussed by Dr. William A. Hammond. Dr. Hammond shows the absurd failures of laws against fine dress, costly food, and smoking, in Rome, France, Turkey, and England, and against the selling and drinking of alcoholic liquors in some of the United States. A careful comparison of secondary school programmes, French and American, will also appear in the May number. The author, Mr. George W. Beaman, maintains, that, if our high and preparatory schools are to compare well with those of France, the pupils must not only do more work, but they must also work on more distinctly specialized lines.

LETTERS TO THE EDITOR.

Anemometry.

It is generally known that quite recently there have been two independent series of investigations of the relation of cup motion in the Robinson anemometer to wind travel,—the one in England, with an arm twenty-nine feet long, upon which the anemometer was whirled in the open air; and the other in this country, with arms of twenty-eight and thirty-five feet and used in a large closed court. It has been charged that the experiments in this country were modelled after those in England; but this is not the fact, for the experiments in Washington were nearly completed before a word had come over regarding the others. A good proof of this is found in the fact that Professor Marvin was so successful in refining the apparatus and in using electrical contacts, that it required only a few hours to show that no experiments of value could be tried in the open air, while this has been learned in England only after many months. In the January number of the *Quarterly Journal of the Royal Meteorological Society* there has appeared a second series of experiments tried in England, which are quite interesting and in many respects novel.

The earlier results showed that at low velocities there were very great irregularities, though these practically disappeared at fifteen miles per hour. In the open air the free wind would undoubtedly equal a slow motion of the whirler; and as has been shown, under these conditions, the factor would be made twenty-five per cent too small. If we add to this the effect of irregularities from whirls in the air and in the experiments, nearly all the difficulty would be accounted for.

To account for these irregularities, it has been suggested that in the open air the more or less intermittent action of the wind would tend to continually accelerate or retard the cups; and, since they have a momentum, this would tend to carry them faster than the wind during the retard, so that there would be a gain in the total movement recorded by the cups over the motion of the whirler and the free wind. This view loses sight of the very important consideration that during a rising wind the cups would lag behind, and presumably just the amount of the acceleration during a falling wind. This point could only be settled by experiment, and the following facts seem to show that this supposed effect is either inappreciable or just the contrary to what is desired.

1. The weight of a very light set of cups was increased four-fold, and in the open air there was no change in the result.
2. Two sets of cups, which were exactly alike except that one was eight times as heavy as the other, were compared side by side. It was found that in light winds the lighter cups gave two to four per cent more wind, and that they were alike in higher winds.
3. Professor Marvin increased the moment of inertia two to

three times in a set of cups, and found that the lighter gave more than ten per cent more wind at five miles per hour, while there was no difference between the light and heavy cups in higher winds.

4. In the more recent trials in England, an anemometer was placed, with its axis horizontal, on the arm of a whirler, and the whirler rotated once and then suddenly stopped: the anemometer cups (supposedly from their momentum) continued to revolve. This experiment was certainly most remarkable. It is a little difficult to see what other result was to be expected. If any thing was to be learned, it could only be by stopping the cups at exactly the moment the whirler was stopped. This certainly does not elucidate in any way whatsoever the supposed inertia effect in an intermittent wind.

5. The crucial test in the English trials was made when the whirler was given an intermittent motion or one simulating a natural wind. The anemometer was placed on the end of the arm, and the velocity of the whirler was changed quite rapidly, ranging back and forth between forty and ten miles per hour,—a far greater fluctuation than can occur in the free air. Here, then, above all things else, we ought to get an inertia effect; but it was found that there was no difference in the record of the anemometer between the uniform and intermittent motion. The evidence seems to be overwhelming that the supposed momentum or inertia effect is purely imaginary.

We cannot sympathize with the feeling aroused in England by these experiments; namely, that the Robinson anemometer is untrustworthy. Undoubtedly the Kew instrument, with its 12-inch cups and 24-inch arms, is exceedingly clumsy, and should be discarded as soon as possible; but the experiments in this country have shown that with 4-inch cups and 6.72-inch arms the results are all that could be asked near ten miles per hour, and during about eighty per cent of our winds. It has also been demonstrated that an anemometer can be constructed which will give very good results over a large range of wind velocity. It is very certain that the Robinson anemometer is far ahead of any instrument that requires a vane. In the English trials a vane anemometer or air-meter gave much more

uniform results than any other instrument in the open air, but this was simply because the effect of the natural wind would be almost exactly counterbalanced on opposite sides of the whirl. In portions of the whirl where the wind would tend to accelerate the motion, the much more rapid whirler motion would tend to keep the vane normal to the arm; and, even if the vane had any influence, it would tend to turn the anemometer at an angle with the arm in such a way as to make it lose the proper speed which it would have in its normal position.

It seems probable that the anemometer problem has nearly reached its solution. What are now needed most of all are experiments with an anemometer, as light as practicable, and which will present a slightly greater proportional resistance to the higher winds than to the lighter, and possibly cause fewer whirls around the cups.

H. A. HAZEN.

Washington, April 11.

Supposed Aboriginal Fish-Weirs in Naaman's Creek, near Claymont, Del.

THE copy of my letter published by the Rev. Mr. Peet in Vol. XII. of the *American Antiquarian*, March, 1890, No. 2, is correct in some respects, and incorrect in others. So far, Mr. Peet has failed to prove that I ever used the word "pile-dwellings," or "river-dwellings." My denial is quite as good as his assertion in this respect, until the original letter be produced, and proven to be mine. I have already given a true version of this letter in a former communication to *Science*, and sufficient reasons for the use of the terms "pile-structures," "pile-ends" or "log-ends," and "stations." They are sufficiently clear explanations for any one to understand without danger of an erroneous impression. No repetition of this explanation is therefore necessary. I call Mr. Peet's particular attention to this assertion.

In the reproduction of my letter, published on p. 118, *American Antiquarian*, March, 1890, I desire to correct the following error: "The numerous suggestions that the pile-structures were fish-weirs is untenable," should read "the numerous suggestions that the pile-structures were fish-weirs is tenable;" and if my



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